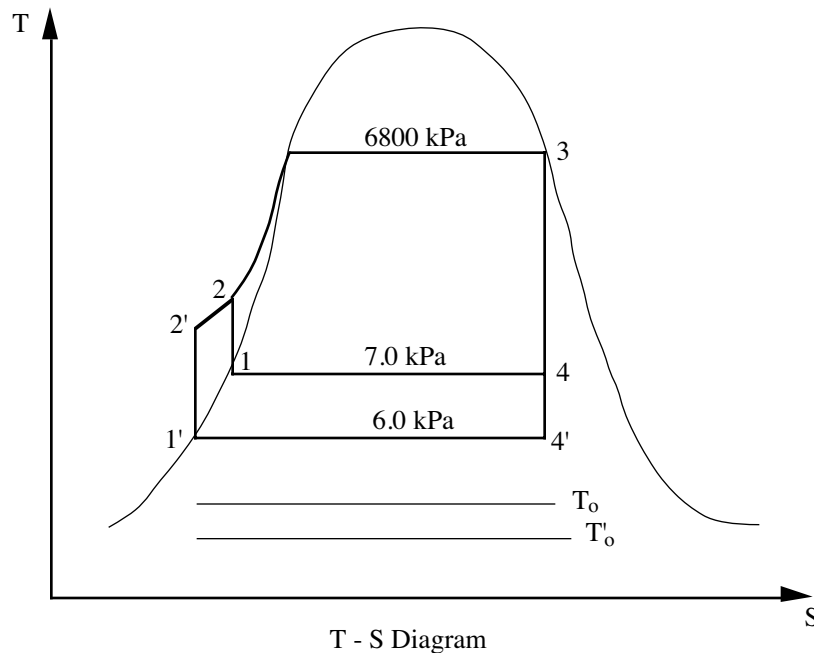


# PROBLEM 6-11N QUESTION

## Irreversibility Problems Involving The Rankine Cycle

Consider the Rankine cycles given in the T-S diagram and defined by operating conditions of Table 1. The cycles differ in the temperature and pressure of the condensation process. What are the differences in cycle irreversibilities between the two cases for irreversibilities defined as:

1. Irreversibility per unit mass flowrate of working fluid,  $\dot{I}/\dot{m}_s$ , and
2. Irreversibility per unit mass flowrate of working fluid and energy input, i.e.,  $\dot{I}/\dot{Q}_{in} \dot{m}_s$ .



**Table 1. Operating Conditions**

Points	Pressure (kPa)	Condition
1	7.0	Saturated Liquid
2	6800.0	
3	6800.0	Saturated Vapor
4	7.0	
1'	6.0	Saturated Liquid
2	6800.0	
3	6800.0	Saturated Vapor
4'	6.0	